[0051] In FIGURE 8 [[A]], collimated light is projected from inside canopy 72 onto screen 74 located outside canopy 72. A pattern contained within the collimated lights 72 is imaged and recorded with screen 74. Collimated light source 78 projects collimated light 80 through a Hartmann mask 84 or other optical mask as known to those skilled in the art. The collimated light is then imaged and recorded by camera 88. The distance between screen 74 and canopy 72 may be varied to help determine the optical distortion caused by canopy 72. Images 86 are taken with the canopy up and down, allowing the angular deviations caused by the linear distance between screen 74 and canopy 72 to be determined at each position, with and without the canopy.

[0052] In ~~FIGURE 8B~~ another embodiment, collimated light is projected from inside the canopy [[72]] onto two ground glass screens ~~74A and 74B~~ located outside the canopy [[72]]. A pattern contained within the collimated light is imaged and recorded with screens ~~74A and 74B~~. The ~~Collimated~~ collimated light source ~~78~~ projects collimated light ~~80~~ which is reflected by a pair of reflective surfaces ~~75~~, that pivot about a point [[77]], through a Hartmann mask ~~84~~ or other optical mask as known to those skilled in the art. By pivoting ~~about point 77~~, the light may be directed at various angles through Hartmann mask ~~84~~. The light passes through and is divided by beamsplitter ~~79~~. This allows light ~~80~~to be imaged on ground glass screens ~~74A and 74B~~ at different distances d_1 and d_2 from the canopy~~72~~. Cameras ~~88A and 88B~~record the images ~~86A and 86B~~from the ground glass screens ~~74A and 74B respectively~~. Images ~~86A and 86B~~, being located at different distances from the canopy [[72]] are used to establish a three-dimensional vector field. ~~This is further illustrated in FIGURE 8C.~~ Images ~~86A and 86B~~ are

taken with the canopy up and down, allowing the angular deviations caused by the linear distance between screens ~~74A and 74B~~, and canopy [[72]] to be determined at each position, with and without the canopy.

[0053] ~~FIGURE 8C shows that a~~ A ray of light [[80]] exiting canopy [[72]] has direction cosines (K, L, M). These are defined as $K = \frac{(x_2 - x_1)}{d}$, $L = \frac{(y_2 - y_1)}{d}$, and $M = \frac{\Delta z}{d}$, where $d = \sqrt{[(x_2 - x_1)^2 + (y_2 - y_1)^2 + (\Delta z)^2}$. The elevation angular deviation "El" is the arcsine of direction cosine L, then the azimuth angular deviation is the arcsine of $\frac{K}{\cos(El)}$. A processor ~~Processor 81 of FIGURE 8B~~ operates on the images ~~86A and 86B~~ to define the sub-aperture centroids.

The Commissioner is hereby authorized to charge any fees or credit any overpayments to Deposit Account No. 50-2240 of Koestner Bertani, LLP.

Respectfully submitted,

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